



ENVIRONMENTAL CONSULTING • GEOTECHNICAL ENGINEERING • CONSTRUCTION MATERIALS TESTING

PN: 16966

November 20, 2009

Ms. Jean Firth
Maine Department of Environmental Protection
17 State House Station
Augusta, Maine 04333

RE: Feasibility Study
144 Montello Street
Lewiston, Maine

Dear Ms. Firth:

Summit Environmental Consultants, Inc. (Summit) has prepared this Feasibility Study (FS) for the property located at 144 Montello Street in Lewiston, Maine (the Site). The purpose of this feasibility study is to develop, evaluate, and recommend remedial alternatives for the Area of Concern (AOC) located in the southern portion of the property. The AOC is defined as Polycyclic Aromatic Hydrocarbon (PAH) impacted fill material previously placed on the property and characterized during Phase II Environmental Site Assessment (ESA) activities (see Phase II ESA report dated October 27, 2009). The costs provided are based on estimates obtained from a limited number of sources; actual costs may vary based upon bid results. In addition, costs provided are based upon John F. Murphy Homes (the Site owner) conducting the bidding and administration of the construction contract.

This FS was developed to address the Recognized Environmental Conditions (RECs) associated with the Site as identified during the *Phase II Environmental Site Assessment* completed by Summit dated October 27, 2009. This FS was completed by Summit for, and at the request of, the Maine Department of Environmental Protection (MEDEP) (the Client) under a grant (2B-96112201-0) from the American Recovery and Reinvestment Act of 2009 (ARRA).

1.0 INTRODUCTION

1.1 Site Location

The Site consists of an approximately 0.86 acre parcel of property located at 144 Montello Street in Lewiston, Maine. The City of Lewiston Tax Assessor identifies the Site as a portion of Lot 25 on Map 143. At the time of the Phase I Site visit, the City of Lewiston had not subdivided the Site away from the parent parcel. The Androscoggin Country Registry of Deeds has a legal description of the parent parcel recorded in Book 4830 Page 169. The Site is located in an area zoned by the City of Lewiston as Suburban Residential (SR). A Site Location Map is included as Figure 1 and a Site Plan is included as Figure 2.

Lewiston:

640 Main Street • Lewiston, ME 04240
Tel: (207) 795-6009 • Fax: (207) 795-6128

Bangor:

8 Harlow St., Suite 4A • Bangor, ME 04401
Tel: (207) 262-9040 • Fax: (207) 262-9080

Augusta:

434 Cony Road • Augusta, ME 04330
Tel: (207) 621-8334 • Fax: (207) 626-9094

Portland:

1 Industrial Way, Suite 7 • Portland, ME 04103
Tel: (207) 221-6360 • Fax: (207) 221-6146

The Site is an undeveloped parcel of land with relatively flat topography, sloping downward to the northeast toward a small unnamed stream and wetland complex that runs through the northern portion of the Site. Adjoining properties include Montello Street and residential properties to the south, undeveloped land to the north and east, and residential properties to the west.

The United States Geological Survey (USGS) Lewiston, Maine 7.5 Minute Topographic Quadrangle Map, which includes the Site and surrounding properties, shows that the Site is at an approximate elevation of 232 feet above mean sea level.

The Bedrock Geology Map of Maine (Thompson et al. 1985), describes the Site as being underlain by the Sangerville Formation which consists of interbedded pelite and limestone and/or dolostone. The Surficial Geologic Map Maine (Osberg et al. 1985) indicates that glacial till deposits consisting of sand, silt clay, and stones underlie the Site.

1.2 Site History

Information from local officials and available historic records suggest that the Site has not been previously developed. Historical records and aerial photographs show the Site as undeveloped; however, earthen fill has been placed on the southern portion of the Site resulting in a relatively flat surface topography. The fill extends 60 to 100 feet +/- from Montello Street toward the north (covering approximately one-half of the property), terminating at a wetland that bisects the property.

1.3 Phase II ESA

A Phase II Environmental Site Assessment – 144 Montello Street – Lewiston, Maine was completed by Summit in October 2009. The Phase II investigations were focused on that portion of the property south of the identified wetland (the AOC) where a proposed building and parking area are proposed to be constructed (refer to Figure 2). Identified contaminants of concern (COCs) within this southern portion of the Site are discussed below.

Based on field observations, field screening results and laboratory analytical results, Polycyclic Aromatic Hydrocarbons (PAHs) are present within fill material previously placed at the Site. PAHs were not detected in a background soil sample collected on the northern portion of the Site beyond the limit of fill.

PAHs were reported present in each test pit sample collected from the fill. Concentrations varied between sample locations with concentrations reported both above and below MEDEP Remedial Action Guidelines (RAGs). Samples from Test Pits TP-A and TP-C (refer to Figure 2 for test pit locations) exhibited the highest concentrations of PAHs with up to 5 individual compounds exceeding their respective target guidelines as presented in Appendix A of MEDEP's July 2009 RAG document.

Individual PAH concentrations ranged between ND and 20 mg/kg for all samples collected (i.e., July 2009 and October 2009). As a result, it does not appear that "hot spots" are likely to be present within the fill, but rather PAHs have been more evenly distributed throughout the fill material.

Given the likelihood that fill was loaded into delivery trucks at the source(s), dumped on the Site and subsequently graded to a relatively flat surface, a more uniform distribution of PAHs could reasonably be expected within the fill at the Site.

Under current conditions, exposure risk is considered moderate due to the presence of fill material at ground surface and lack of deterrents to trespassers. However, there is no evidence that trespassers routinely traverse the Site, and concentrations of PAHs are not uniformly above target guidelines. Nonetheless, exposure to fill material with elevated PAH concentrations can occur under current conditions and should future activity include disturbance of the fill, a greater exposure risk may occur unless a soil (fill) management plan is implemented.

1.4 Remedial Objectives

The purpose of this FS is to develop, evaluate, and recommend remedial alternatives for remediating the contaminated soil (fill) associated with the AOC. The remedial objectives for the Site are to eliminate, or minimize the possibility of human and ecological receptor exposure to impacted soils while facilitating development of the proposed building and parking area.

Those remedial alternatives that do not result in complete removal of impacted soils will require a deed restriction. The restriction will prohibit excavation activity in areas of known contamination without first notifying MEDEP to receive permission.

2.0 EVALUATION OF REMEDIAL ALTERNATIVES

The remedial objectives for the impacted soil located on the Site are to prevent human dermal contact with reported PAH soil contamination, facilitate proposed site development and to limit contaminants from migrating into the unnamed stream and wetland area located on the northern portion of the Site via bank erosion and surface water runoff. See Figure 2 for a Site Plan depicting the area of concern (AOC).

2.1 AOC: CONSIDERED ALTERNATIVES

Fill soil within the southern portion of the Site has been identified as containing PAH concentrations reported both above and below MEDEP RAGs. The primary risk associated with this contamination is direct contact with the soil and migration of contaminants into the unnamed stream and wetland. Four (4) remedial options have been identified to meet the remedial objectives for the AOC:

Option 1 - Excavation of impacted soil from building foundation, parking/driveway and utility trenches will be relocated on site to the extent possible, with excess contaminated fill removed and disposed off-site at a secure landfill. Relocated soils and undisturbed impacted soils remaining on site would be covered with a soil barrier layer (cover system). The embankment where the AOC abuts the wetland would be stabilized with riprap to mitigate erosion and migration of contaminants into the stream and/or the adjacent wetland area. This option assumes that the Fill relocation area will not accommodate all of the impacted fill requiring relocation and that excess impacted material will be disposed of off-site.

Option 2 - Excavation of impacted soil disturbed by the proposed construction and site development activities and relocation of all disturbed impacted fill material on-site. Relocated

and undisturbed impacted soils remaining on site would be covered with a barrier layer (common borrow and loam. Similar to option 1, the embankment where the AOC abuts the wetland would be stabilized with riprap to mitigate erosion and migration of contaminants into the wetland area.

Option 3 - Excavation of all impacted soil in the AOC and disposal off-site at a secure landfill;

Option 4 – “No Action”.

These alternatives were selected based upon their 1) implementability, 2) cost associated with completion of the alternative, and 3) effectiveness of the alternative.

2.1.1 Option 1: Soil Remediation via Excavation, Relocation On-Site and Off-Site Disposal

A focused soil excavation and removal would be conducted to remove impacted soil within the proposed area of development. Removal would include 3 feet of impacted soil within the building footprint (approximately 210 cubic yards), 18 inches of soil within the area of pavement and island (approximately 205 cubic yards), soil removed to accommodate utility and building drain trenches (approximately 50 cubic yards) for a total volume of approximately 465 cubic yards.

This option assumes that only a portion of the impacted soil would be relocated in the area between the development (building and driveway/parking) and the wetland. This option assumes a relocation area of approximately 140 feet by 40 feet, with 1.5 feet of relocated impacted fill, accommodating approximately 300 cubic yards. An 8-inch thick soil barrier layer will be placed above the relocated fill. The resulting 24 to 26-inch increase in grade is the maximum as recommended by the site earthwork contractor to facilitate site grading and proper drainage. The actual horizontal and vertical limits of the relocation area would be based on final site grading and survey plans, including setback requirements.

The relocated impacted soil and remaining site areas not covered with pavement or the building would be covered with an 8-inch layer of clean soil, including a minimum 4 inches thick topsoil (loam) layer. Disturbed surfaces would be seeded and mulched.

The remaining 165+/- cubic yards of impacted soil would be characterized prior to removal and transported to a secure landfill facility for disposal.

This option assumes that a 12 inch thick riprap slope will be constructed along the boundary of the AOC with the wetland. In addition, non-woven fabric will be placed between the impacted soil and the barrier layer to provide stability and a warning layer.

Effectiveness

This option will meet remedial objectives. Protection of human health and the environment will be achieved by relocating impacted soils beneath either a soil barrier layer or pavement with excess impacted soil being removed for off-site disposal. The potential for future direct exposure and migration will be minimized at the Site. This option will provide long-term effectiveness and permanence unless unauthorized excavation/disturbance of the covered impacted soil occurs. Institutional controls requiring Maine DEP approval will be required before conducting activities that may disturb the capped soil.

Implementation of this alternative could have potential short-term adverse effects on site workers. Risks to site workers during relocation of impacted soil activities will be minimized by

an "awareness training program" and the development and adherence of a site-specific Health and Safety Plan (HASP). The HASP will also address the reduction of potential risks to Site workers during excavation and consolidation activities, as well as during loading material for off-site disposal. Excavation and handling of contaminated soils could result in particulate emissions and must be managed by implementing dust control measures.

Implementability

This alternative uses well-demonstrated and readily available technologies. It is anticipated that excavation, relocation and/or off-site disposal of impacted soils can be completed safely. An excavation contractor using trained personnel will conduct soil removal and soil cover system construction activities.

Relocation of surficial soils will not interfere with the ability to conduct the proposed development of the Site. The relocation area on the site is north of current development plans for the Site. The removal, handling, and transportation of impacted soils will be performed using conventional construction equipment and technologies. Groundwater encountered during excavation of the building foundation may be discharged to the surface subject to applicable regulations (local ordinances, sediment control, etc.).

Site restoration activities will be consistent with the architect's plans and specifications for the Site. Placement of clean fill, grass cover and mulch and riprap will provide long-term erosion and sediment control for excavated areas and the soil cap.

Cost

Costs for this alternative consist of direct and indirect costs. In determining the cost of this option, the estimated quantity of soil to be relocated on site was based on preliminary building and pavement layout information provided by the Owner (refer to Figure 2). As discussed above, depth of soil removal is assumed to be 3 feet within the building footprint, 18 inches of soil depth within the area of pavement, and 3-4 feet in utility trenches. This option assumes a utility trench between the building and the street, and a trench for the building foundation drain discharging to the northern portion of the site. However, as final design and survey plans are not available, any additional impacted soil removed due to site grading limitations has not been included in the estimated cost for this alternative.

The cost of this work is estimated at \$38,310. Table 1 summarizes the cost estimate for this alternative. It should be noted that previously planned development costs for excavation and site earthwork have been deducted from the total remedial cost for option 1.

Table 1: Option #1 Estimate of Probable Costs

Work Items	Unit Price	Unit	Quantity	Estimated Cost
Mobilize/Demobilize	\$2,500	Unit	1	\$1,500
Erosion & Sediment Controls (Silt Fence)	\$3	LF	250	\$750
Clear & Grub, Misc Grading	\$6,000	Acre	0.40	\$2,400
Excavate & Temporarily Stockpile Impacted Soil	\$3	CY	165	\$495
Excavate & Relocate Impacted Soil	\$5	CY	300	\$1,500
Place Non Woven Filter Fabric (4 oz)	\$0.30	SF	12,200	\$3,660
Furnish & Place Riprap	\$40	CY	50	\$2,000
Soil Barrier Layer (4 " common borrow)	\$12	CY	175	\$2,100
Topsoil Layer (4" loam)	\$20	CY	175	\$3,500
Seed & Mulch	\$1,500	Acre	0.4	\$600
Load Impacted Materials (truck measure)	\$2	CY	165	\$330
Haul and Dispose of Impacted Materials	\$132	CY	165	\$21,780
Subtotal				\$40,615
Contingency	10%	% Total		\$4,060
Health & Safety				\$635
Oversight	\$300*	Days	10	\$3,000
Estimated Total				\$48,310
Credit for previously budgeted site earthwork				(\$10,000)
Say Estimated Total				\$38,500

Note: Design & Bidding by Others
* assumes 4 hours per day

2.1.2 Option 2: Soil Remediation via Excavation and Relocation On-Site

A focused soil excavation and removal would be conducted to remove impacted soil within the proposed area of development. Removal would include 3 feet of soil (depth) within the building footprint (thickness of the impacted fill in that area), 18 inches of soil within the area of pavement, soil removed to accommodate utility and building drain trenches, and other soils impacted by site grading activities.

This option assumes that all of the impacted soil would be relocated in the area between the development and the wetland. This option assumes a relocation area of approximately 140 feet by 40 feet, with 2.2 feet of relocated impacted fill, accommodating approximately 465 cubic yards. A 8-inch thick soil barrier layer will subsequently be placed above the relocated fill. The resulting increase in grade will be 3.0 feet within the consolidation area. The actual horizontal and vertical limits of the relocation area would be based on final site grading and survey plans, including setback requirements.

The relocated soil and remaining site areas not covered with pavement or the building would be covered with a 8-inch layer of clean soil, including a minimum 4 inches thick topsoil (loam) layer. Disturbed surfaces would be seeded and mulched.

This option assumes that a 12 inch thick riprap slope will be constructed along the boundary of the AOC with the wetland. In addition, non-woven fabric will be placed between the impacted soil and the barrier layer to provide stability and a warning layer.

Effectiveness

This option will meet remedial objectives. Protection of human health and the environment will be achieved by relocating impacted soils beneath either a soil cover system or pavement. The potential for future direct exposure and migration will be minimized at the Site. This option will provide long-term effectiveness and permanence unless unauthorized excavation/disturbance of the covered soil occurs. Institutional controls requiring Maine DEP approval will be required before conducting activities that may disturb the capped soil.

Implementation of this alternative could have potential short-term adverse effects on site workers. Risks to site workers during relocation of impacted soil activities will be minimized by an "awareness training program" and the development and adherence of a site-specific Health and Safety Plan (HASP). The HASP will also address the reduction of potential risks to Site workers during excavation and consolidation activities. Removal and handling of contaminated soils could result in particulate emissions and must be managed by implementing dust control measures.

Implementability

This alternative uses well-demonstrated and readily available technologies. It is anticipated that removal and relocation of impacted soils can be completed safely. An excavation contractor using trained personnel will conduct soil removal and soil cover system construction activities.

Relocation of impacted soil may interfere with the ability to conduct the proposed development of the Site. The location and height of the relocation area may limit site drainage and development options without additional engineering controls (i.e., retaining walls) or cause potential impacts to the wetland complex if the relocation area is expanded into the wetland.

The excavation, handling, and placement of impacted soils will be performed using conventional construction equipment and technologies. Groundwater encountered during excavation of the building foundation may be discharged to the surface subject to applicable regulations (local ordinances, sediment control, etc.).

Site restoration activities will be consistent with the architect's plans and specifications for the Site. Placement of clean fill, grass cover and mulch and riprap will provide long-term erosion and sediment control for excavated areas and the soil cover system.

Cost

Costs for this alternative consist of direct and indirect costs. In determining the cost of this option, the estimated quantity of soil to be relocated on site was based on preliminary building and pavement layout information provided by the Owner (refer to Figure 2). As discussed above, depth of soil removal is assumed to be 3 feet within the building footprint, 18 inches of soil depth within the area of pavement, and 3-4 feet for utility trenches. However, as final design and survey plans are not available, any additional impacted soil removed due to site grading activities has not been included in the estimated cost for this alternative.

The cost of this work is estimated at \$ 14,500. Table 2 summarizes the cost estimate for this alternative.

Table 2: Option #2 Estimate of Probable Costs

Work Items	Unit Price	Unit	Quantity	Estimated Cost
Mobilize/Demobilize	\$2,500	Unit	1	\$1,500
Erosion & Sediment Controls (Silt Fence)	\$3	LF	250	\$750
Clear & Grub, Misc Grading	\$6,000	Acre	0.40	\$2,400
Excavate & Relocate Impacted Soil	\$5	CY	465	\$2,325
Place Non Woven Filter Fabric (4 oz)	\$0.30	SF	12,200	\$3,660
Furnish & Place Riprap	\$40	CY	50	\$2,000
Furnish & Place Soil Barrier Layer (4 " common borrow)	\$12	CY	350	\$2,100
Furnish & Place Topsoil Layer (4" loam)	\$20	CY	175	\$3,500
Seed & Mulch	\$1,500	Acre	0.4	\$600
Subtotal				\$18,835
Contingency	10%	% Total		\$1,880
Health & Safety				\$635
Oversight	\$300*	Days	10	\$3,000
Estimated Total				\$24,350
Credit for previously budgeted site earthwork				(\$10,000)
	Say Estimated Total			\$14,500

Note: Design & Bidding by Others

* assumes 4 hours per day

2.1.3 Option 3: Soil Remediation via Excavation and Off-Site Disposal

This option assumes all impacted soil on the Site would be removed and disposed off-site. Impacted soil is assumed to average approximately 4 feet thick across the AOC. The impacted soil would be characterized and transported to a secure landfill facility for disposal.

Effectiveness

This option will meet remedial objectives. Protection to human health and the environment will be achieved by excavation and off-site disposal of all PAH impacted soil fill at the Site. The

potential for future direct exposure and migration will be eliminated at the Site. This option will provide long-term effectiveness and permanence. Institutional controls would not be required.

Implementation of this alternative could have potential short-term adverse effects on site workers. Risks to site workers during removal of impacted soil will be minimized by an "awareness training program" and the development and adherence of a site-specific Health and Safety Plan (HASP). The HASP will also address the reduction of potential risks to Site workers during excavation, loading and transportation activities. Removal and handling of contaminated soils could result in particulate emissions and must be managed by implementing dust control measures.

Implementability

This alternative uses well-demonstrated and readily available technologies. It is anticipated that removal, transport and off-site disposal of impacted soils can be completed safely. An excavation contractor using trained personnel will conduct soil removal activities.

Removal of impacted soil will not interfere with the ability to conduct the proposed development of the Site, although additional clean fill may be required to obtain final design grades. The removal, handling, and transportation of impacted soils will be performed using conventional construction equipment and technologies. Groundwater encountered during soil removal may be discharged to the surface subject to applicable regulations (local ordinances, sediment control, etc.).

Cost

Costs for this alternative consist of direct and indirect costs. In determining the cost of this option, the estimated quantity of soil to be removed from the site was based on an assumed depth of 4 feet over the footprint of the AOC.

The cost of this work is estimated at \$ 437,000. Table 3 summarizes the cost estimate for this alternative.

Table 3: Option #3 Estimate of Probable Costs

Work Items	Unit Price	Unit	Quantity	Estimated Cost
Mobilize/Demobilize	\$2,500	Unit	1	\$1,500
Erosion & Sediment Controls (Silt Fence)	\$3	LF	250	\$750
Excavate & Temporarily Stockpile Impacted Soil	\$3	CY	2,650	\$7,950
Seed & Mulch	\$1,500	Acre	0.4	\$600
Characterization Sampling (one per 250 tons)	\$1,000	Each	19	\$19,000
Load Impacted Materials (truck measure)	\$2	CY	2,650	\$5,300
Haul and Dispose of Impacted Materials	\$132	CY	2,650	\$349,800
Subtotal				\$384,900
Contingency	10%	% Total		\$38,490
Health & Safety				\$635
Oversight	\$300*	Days	10	\$3,000
Estimated Total				\$427,025
Credit for previously budgeted site earthwork				(\$10,000)
Say Estimated Total				\$437,000

Note: Design & Bidding by Others

* assumes 4 hours per day

2.1.3 Option 4: No Action

No action would be taken and the Site would remain unchanged.

Effectiveness

Impacted soil is present from ground surface to a depth of approximately 4 feet within the AOC (the southern area of the site); therefore, the potential for direct exposure exists. A No Action alternative will not provide long-term effectiveness and permanence. A fence may be required to limit public access to the AOC.

Implementability

The current Owner would not be allowed to develop the property in the area of known contamination. This alternative does not address the existing contamination known to be present on the Site and would result in the potential for contamination migrating to the wetland.

The No Action Alternative is not consistent with remedial goals.

Cost

The costs for this action would be the price of the installation of fencing and signage for the property, as well as deed restrictions.

3.0 SELECTION OF PREFERRED REMEDIAL ALTERNATIVES

A summary of the proposed remedial alternatives is presented in Appendix A. Based upon the review of the alternatives discussed in Section 2, Summit has created the following matrix for the evaluated alternatives for each AOC.

Table 4: AOC-1/2 Comparison of Alternatives

Option	Contamination Removed	Contamination Covered On-Site	Contamination Migration Mitigated	Deed Restriction Required for Future Excavation	Ranking of Costs (1 to 4) 1 = low 4=high
#1: Soil Removal via Excavation, Consolidation/ Capping On-Site & Off-Site Disposal	✓ (Limited)	✓	✓	✓	3
#2: Soil Removal via Excavation and Consolidation/ Capping On-Site		✓	✓	✓	2
#3: Soil Removal via Excavation and Off-Site Disposal	✓		✓		4
No Action				✓	1

All the options except "no action" meet the remedial objectives for the site while allowing the property to be reused; however, Option #1, "Soil Removal via Excavation, Relocation/Covering On-Site & Off-Site Disposal" provides the most cost effective approach to remediate impacted soil while maximizing development options for this site. This option prevents direct contact with the on-site contamination. Impacted soil will remain onsite; however, these materials will be

covered by clean backfill and/or pavement, allowing reuse of the Site for development and public access without limiting grading and drainage issues potentially associated with Option #2.

4.0 VRAP APPLICATION

Following alternative selection, the property Owner should apply to the MEDEP's Voluntary Response Action Program (VRAP) to request a Release of Liability letter for the Site.

The VRAP program attempts to provide liability protection for owners, buyers and/or sellers of property that may contain environmental impacts. In conjunction with implementation of the selected remedial alternative, the VRAP will complete the necessary objectives as detailed throughout this FS process.

5.0 SUMMARY OF REMEDIAL ALTERNATIVES

Table 5 summarizes the recommended remedial alternatives and associated costs for the AOCs discussed above.

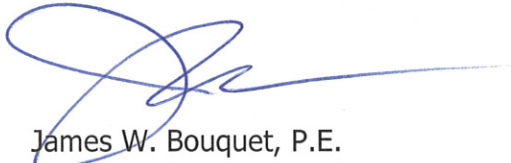
Table 5: Summary of Recommended Remedial Alternatives and Estimated Costs^[JMF1]

Area	Proposed Remedial Alternative	Estimated Cost
Entire site	Impacted Soil Excavation, On-Site Relocation/Soil Cover & Limited Off-Site Disposal	\$38,500.
VRAP	VRAP Application ^[JMF2]	\$500
	Total Estimated Cost	\$39,000.00

Please feel free to contact either of us with questions concerning the remedial alternatives presented in this focused Feasibility Study.

Sincerely,

SUMMIT ENVIRONMENTAL CONSULTANTS, INC.

A handwritten signature in blue ink, appearing to read 'James W. Bouquet', with a large, stylized loop at the beginning.

James W. Bouquet, P.E.
Vice-President, Principal Engineer

A handwritten signature in blue ink, appearing to read 'Mike Deyling', with a cursive style.

Michael A. Deyling, C.G., P.Hg.
President, Principal Hydrogeologist

CC: Ms. Ann Bentley
Mr. Hank Andolsek, MEDEP

FIGURES



FIGURE 1 - SITE LOCATION PLAN
144 MONTELLO STREET

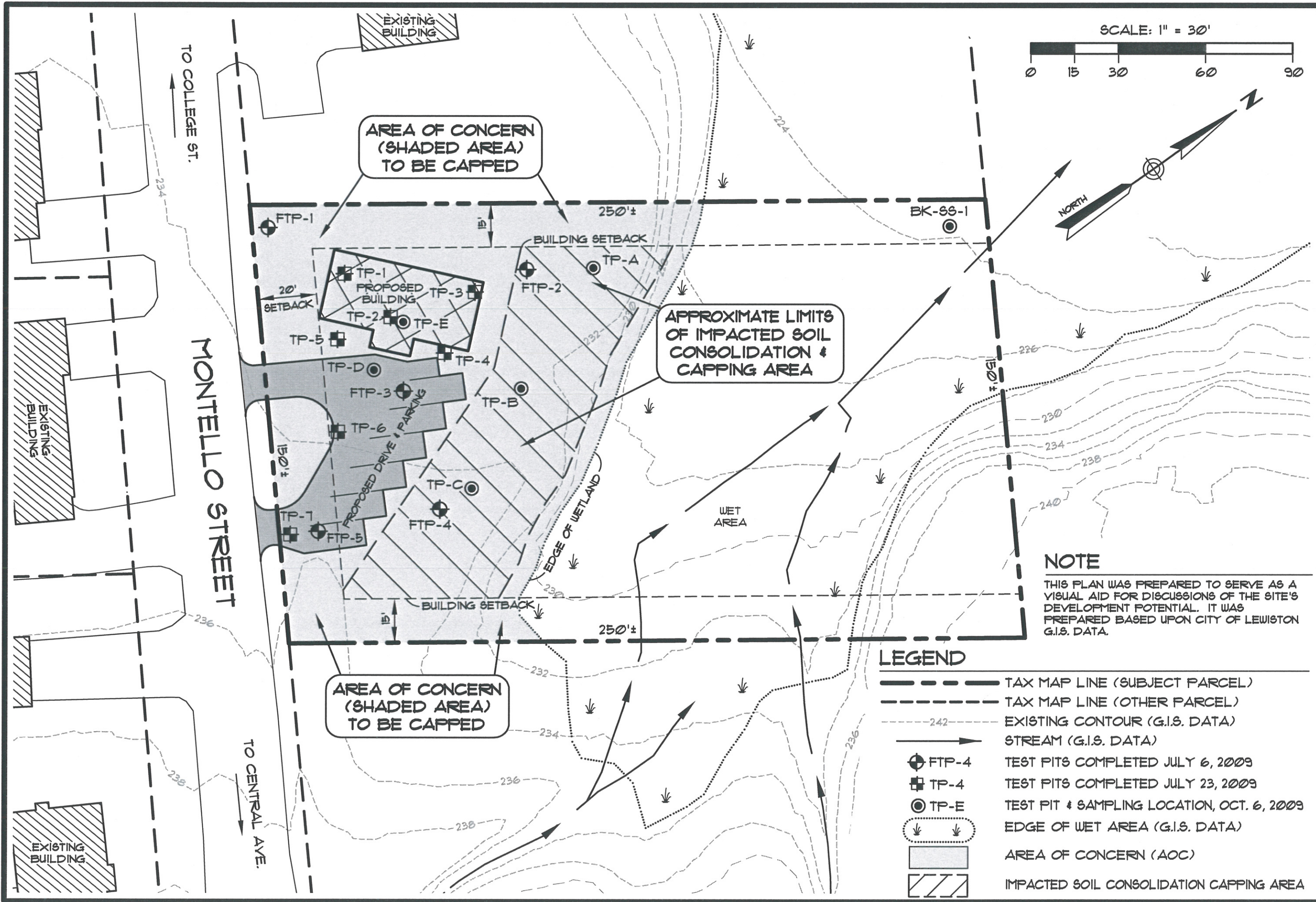
LEWISTON, MAINE
PREPARED FOR
MAINE D.E.P.

640 MAIN ST.
LEWISTON, MAINE 04240

Tel.: (207) 795-6009
Fax: (207) 795-6128

SUMMIT
ENVIRONMENTAL CONSULTANTS

DATE: NOV. 2009	DRAWN BY: PLANIT	CHECKED BY: JB
JOB: 16966	NOT TO SCALE	FILE: 16966 SITE



NOTE
 THIS PLAN WAS PREPARED TO SERVE AS A VISUAL AID FOR DISCUSSIONS OF THE SITE'S DEVELOPMENT POTENTIAL. IT WAS PREPARED BASED UPON CITY OF LEWISTON G.I.S. DATA.

- LEGEND**
- TAX MAP LINE (SUBJECT PARCEL)
 - TAX MAP LINE (OTHER PARCEL)
 - - - - - EXISTING CONTOUR (G.I.S. DATA)
 - STREAM (G.I.S. DATA)
 - FTP-4 TEST PITS COMPLETED JULY 6, 2009
 - TP-4 TEST PITS COMPLETED JULY 23, 2009
 - TP-E TEST PIT & SAMPLING LOCATION, OCT. 6, 2009
 - Edge of Wet Area (G.I.S. DATA)
 - Area of Concern (AOC)
 - Impacted Soil Consolidation Capping Area

PROJECT: 144 MONTELLO ST. - LEWISTON, ME		CLIENT: MAINE DEP.	
TITLE: FEASIBILITY STUDY SITE PLAN	SCALE: 1" = 30'	DRAWN BY: KRF	MAD
	DATE: 11 - 10 - 09	APPR BY:	
Tel: (207) 798-6009 Fax: (207) 798-6128 640 Main Street Lewiston, Maine 04240		SUMMIT ENVIRONMENTAL SERVICES	
PROJ. # 16366		FIGURE: 2	

APPENDIX A

SUMMARY OF REMEDIAL ALTERNATIVES

SUMMARY OF REMEDIAL ALTERNATIVES
Contaminated Soil AOC
144 Montello Street, Lewiston, Maine

Remedial Alternative	Overall Protection of Human Health and the Environment	Technical Practicality	Implementability	Reduction of Toxicity, Mobility and Volume	Short Term Effectiveness	Practicability and Estimated Cost	Comments
1) Soil Removal Via Excavation, Relocation On-Site and Off-Site Disposal	<ul style="list-style-type: none">• Risks to human health by direct contact, inhalation (dust), and ingestion of contaminated media are significantly reduced by removing contaminated media and relocating beneath a soil cover system on a portion of the Site not intended for development.• Risks to the environment by stormwater runoff or groundwater leaching are reduced by placing the contaminated media beneath a soil cover system.	<ul style="list-style-type: none">• Soil removal, on-site relocation and soil cover; and off-site disposal of excess impacted material, utilizes standard excavation and construction techniques and are therefore technically practical for the property.	<ul style="list-style-type: none">• Removal and relocation/covering/off-site disposal of contaminated soil is an accepted form of remediation and has been proven to be effective in minimizing exposure to contamination.	<ul style="list-style-type: none">• Limited removal of contaminated soil for off-site disposal will reduce volume• The contaminated soil remaining on site will be placed beneath a soil cover system; therefore, mobility of the contaminants is reduced.	<ul style="list-style-type: none">• Excavation, relocation/covering and off-site disposal of contaminated media are effective and proven methods of remediation.	<ul style="list-style-type: none">• Impacted soil removal, on-site relocation and placement beneath a soil cover system, and off-site disposal of excess impacted soil will cost approximately \$38,500.	<ul style="list-style-type: none">• The relocation area will need to consider setback requirements of the unnamed stream and property lines.• Riprap will be placed along the slope to the wetland to mitigate erosion and the potential for migration of impacted soil.• Estimated costs may be reduced depending on new development site grading plans and overlap of costs between remediation and site development work.
2) Soil Removal Via Excavation and Relocation On-Site	<ul style="list-style-type: none">• Risks to human health by direct contact, inhalation (dust), and ingestion of contaminated media are significantly reduced relocating contaminated soil beneath a soil cover system on a portion of the Site not intended for development.• Risks to the environment by stormwater runoff or groundwater leaching are reduced by placing the contaminated media beneath a soil cover system.	<ul style="list-style-type: none">• On-site relocation of contaminated soil and covering with clean soil utilize standard excavation and construction techniques and are therefore technically practical for the property.	<ul style="list-style-type: none">• Removal and relocation of contaminated soil is an accepted form of remediation and has been proven to be effective in minimizing exposure to contamination.	<ul style="list-style-type: none">• The contaminated soil remaining on site will be placed beneath a soil cover system; therefore, mobility of the contaminants is reduced.	<ul style="list-style-type: none">• Excavation, relocation and covering of contaminated media are effective and proven methods of remediation.	<ul style="list-style-type: none">• On-site relocation of impacted soil and placement beneath a soil cover system will cost approximately \$14,500.	<ul style="list-style-type: none">• The relocation area will need to consider setback requirements of the unnamed stream and property lines.• Riprap will be placed along the slope to the wetland to mitigate erosion and the potential for migration of impacted soil.• The vertical dimension of the consolidation area may impact site drainage and may limit proposed development options for the Site.
3) Soil Removal Via Excavation and Off-Site Disposal	<ul style="list-style-type: none">▪ Risks to human health by direct contact, inhalation (dust), and ingestion of contaminated media are eliminated by removing contaminated media from the site.▪ Risks to the environment by stormwater runoff or groundwater leaching are eliminated by removing contaminated media from the site.	<ul style="list-style-type: none">▪ Soil removal and off-site disposal utilize standard excavation and construction techniques and are therefore technically practical for the property.	<ul style="list-style-type: none">▪ Removal of contaminated soil is an accepted form of remediation and has been proven to be effective in reducing or eliminating exposure risks.	<ul style="list-style-type: none">• The source of contaminated soil is eliminated; therefore, the toxicity and mobility of the contaminants is eliminated.	<ul style="list-style-type: none">• Removal of contaminated media is an effective and proven method of remediation.	<ul style="list-style-type: none">• Impacted soil removal, and off-site disposal will cost approximately \$437,000.	<ul style="list-style-type: none">• Erosion and sedimentation control will be necessary during removal activities.• Backfill soil costs may be increased depending on new development site grading plans.• This alternative was not selected primarily due to cost.
4) No Action	<ul style="list-style-type: none">• No reduction in risks.• Potential risks to human health by direct contact, inhalation (dust), and ingestion will remain.• Stormwater runoff may introduce contaminated sediments to the unnamed stream and wetland, and increase risks to the environment.	<ul style="list-style-type: none">• Not applicable.	<ul style="list-style-type: none">• Not applicable.	<ul style="list-style-type: none">• No reduction in toxicity, mobility or volume of the contaminated media.	<ul style="list-style-type: none">• Not applicable.	<ul style="list-style-type: none">• Implementation of this alternative will cost approximately \$5,000.	<ul style="list-style-type: none">• This alternative does not reduce identified health or environmental risks and does not support proposed site development plans. This alternative was not selected due to these reasons

Notes: Shaded area indicates selected remedial alternative.